Temporal Evolution and Mapping of Intense Convective Systems Using TROPICS

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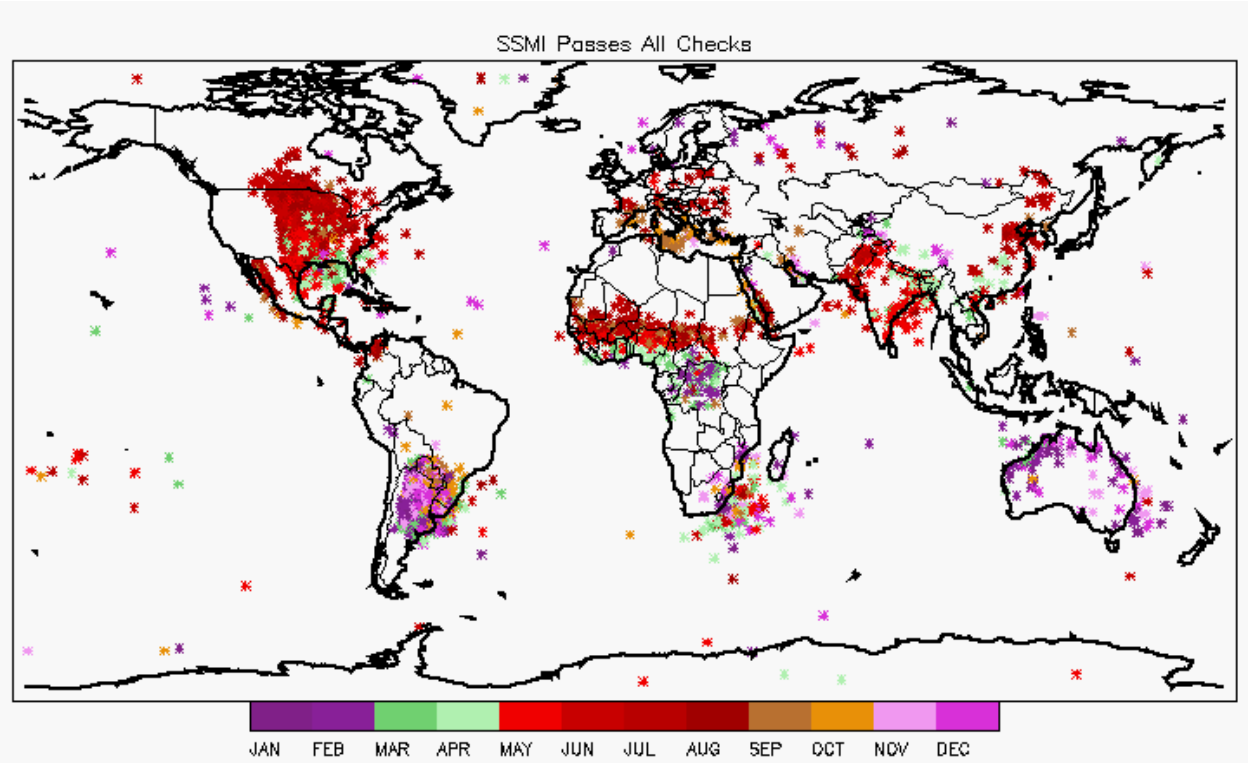
Background

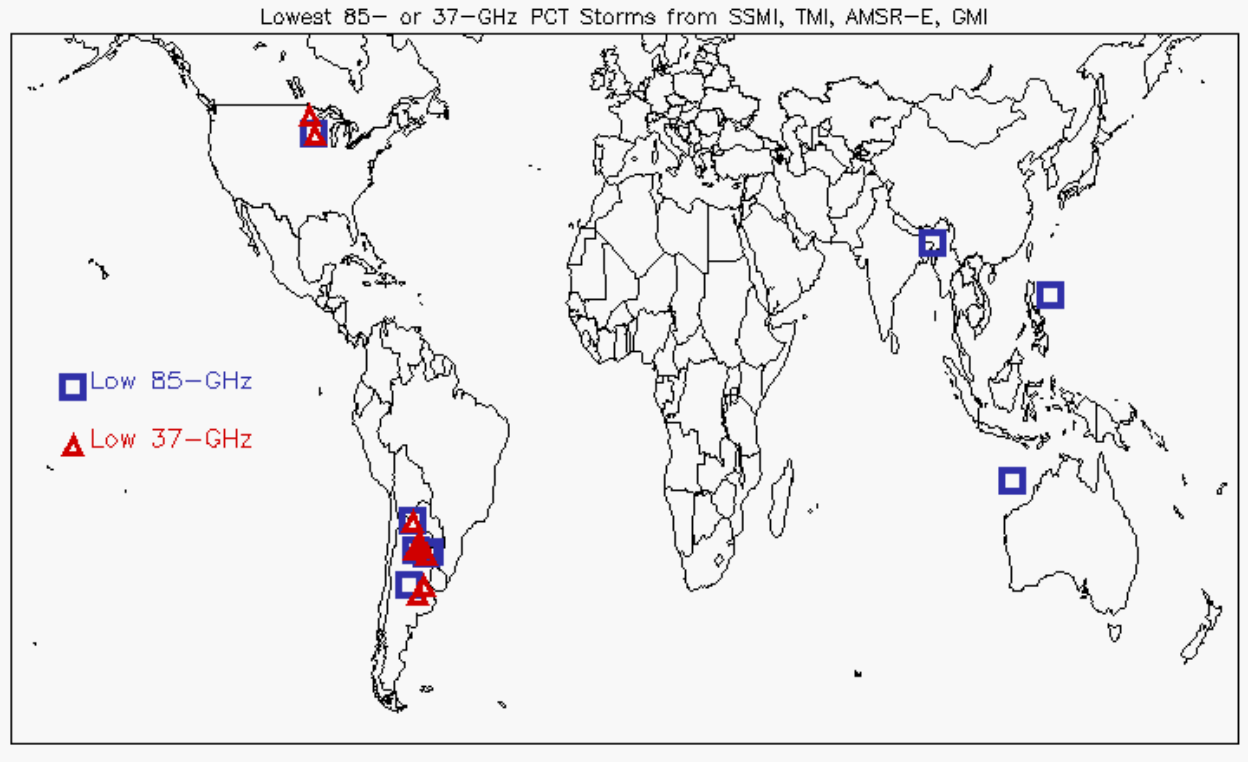
- Passive microwave imagers such as those in GPM constellation, TRMM, SSMI, can be good for identifying intense thunderstorms and developing maps of when/where they occur, how strong they are
- TROPICS might not be well suited for that, because high-frequency channels can make it hard to distinguish between a deep layer of graupel and a smaller layer of hail



SSMI cases with 37 GHz < 200 K

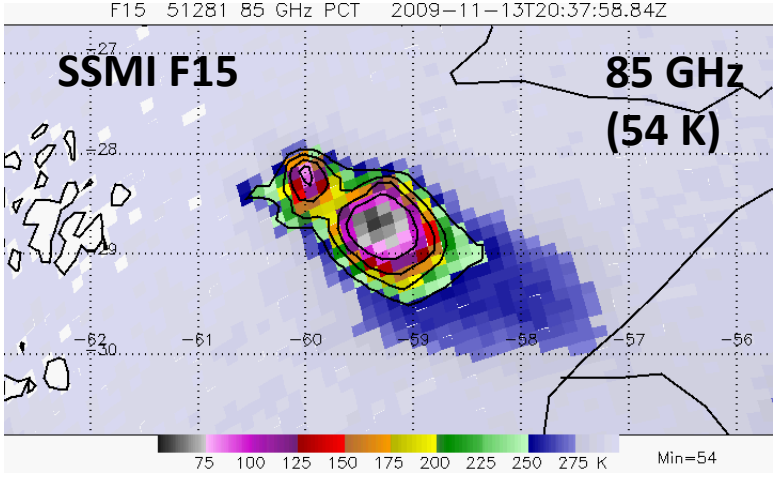
Background

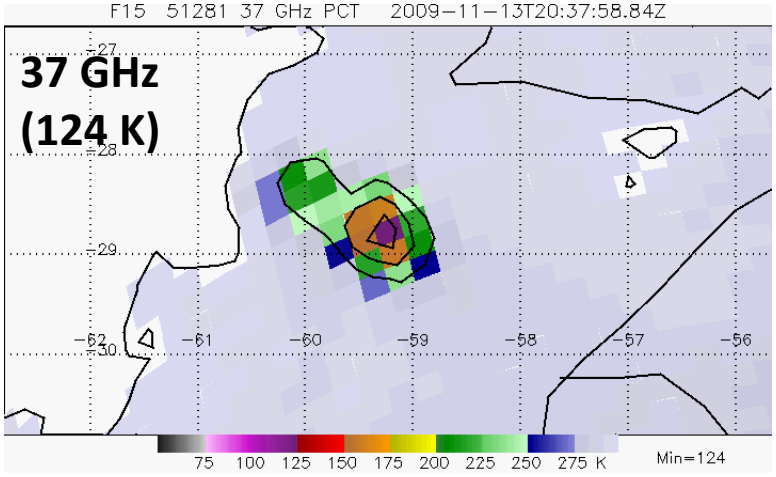
- For individual high-end events, there is some question about whether a satellite just happened to see a storm “at the right time” (when the storm was peaking)
- Alternately, we can question how much stronger a storm was at its peak
- TROPICS can add valuable temporal context



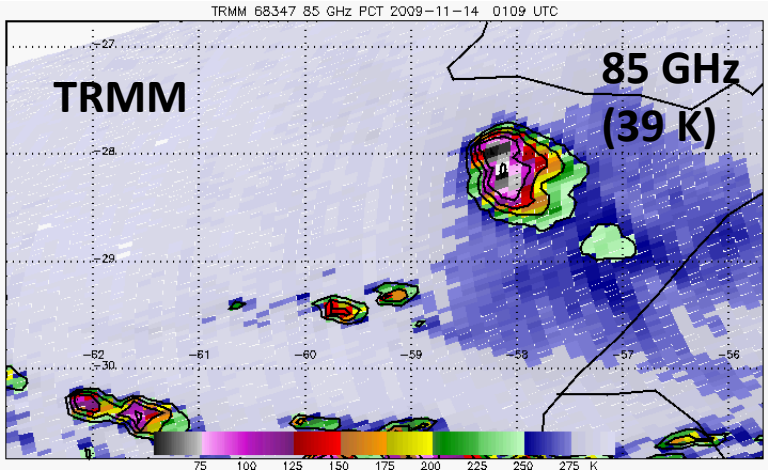
Cases with the lowest 85 GHz or 37 GHz PCT on record (through mid-2015)

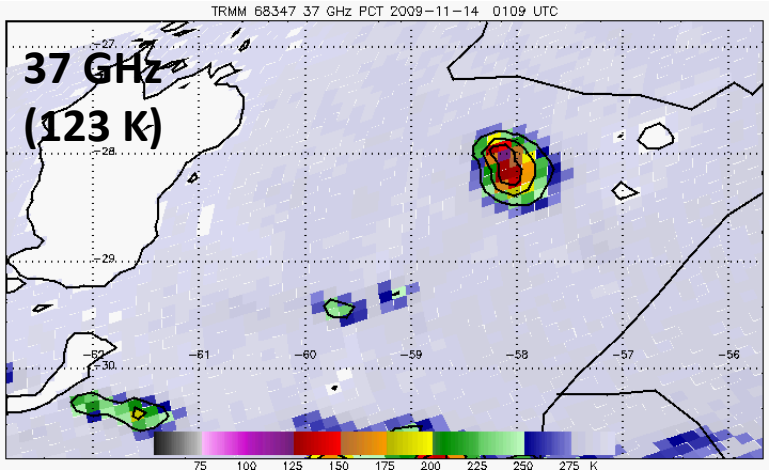
SSMI/TRMM case in Northern Argentina





Lowest 85 GHz PCT on record for either SSMI F15 (54 K at **2152 UTC, top**) or TRMM (39 K at **0109 UTC, bottom**). Also had lowest 37 GHz for F15 (124 K). What happened before, between, and after?





Data Needs

- Calibrated brightness temperature, 90 GHz channel
- No data latency requirement for this research
  - Can envision applications in data sparse regions, with users wanting the data ASAP
- Can retrievals of temperature and moisture profiles be useful for assessing the inflow thermodynamics for these storms? Mesoscale regions where moisture pools, instability gets enhanced?